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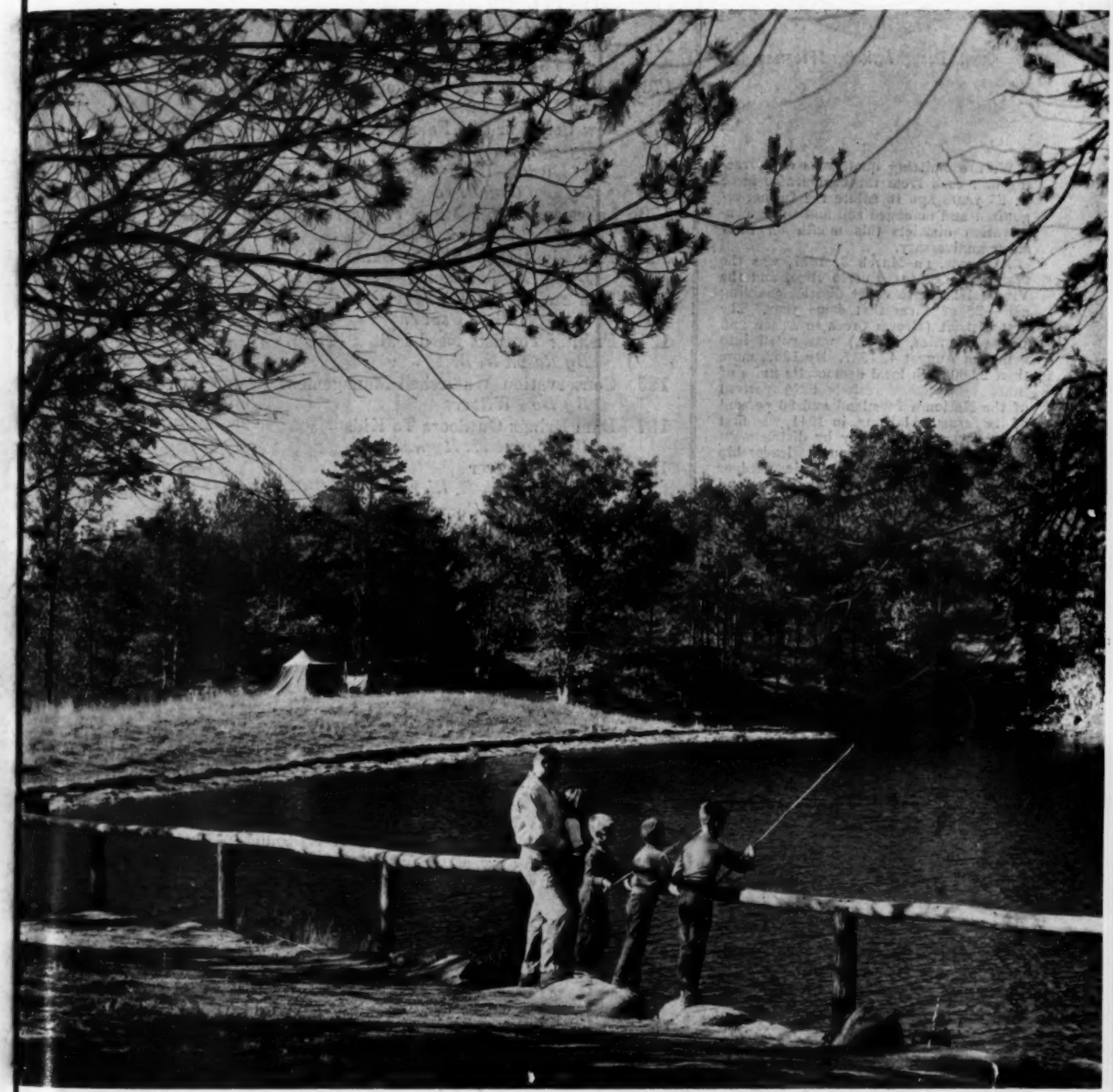
GENERAL INFORMATION

MARCH 1962

Soil Conservation



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

VOL. XXVII, NO. 8 MARCH 1962

Growth Through Agricultural Progress

We are omitting quotations on terracing and such from the comparable issue of 25 years ago to salute the farmer-organized and managed soil and water conservation districts this month on their silver anniversary.

Arkansas, on March 3, 1937, was the first of 50 States, Puerto Rico, and the Virgin Islands to enact district enabling acts—22 of them that same year. The first district (Brown Creek in Anson and Union counties, N. C.) was voted into being on August 4, 1937. By 1962, more than 2,900 such local democratic units of State government include 92½ percent of the Nation's farmland and 96 percent of its farms. Alabama, in 1941, was first to be covered completely by districts.

The districts' subsequent leadership and accomplishments in basic outdoor conservation and use make the SCS proud to be directed by Congress and the Secretary of Agriculture to make its technical and other services available principally through these districts.

—THE EDITOR

COVER PICTURE—Outdoor beauty and enjoyment at their best at the Carolina Trout Pond on the Carolina State Reservation at Richmond, R. I.

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Soil Conservation

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FRANK B. HARPER, Editor

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Soil and Water Conservation Basic To Outdoor Preservation

By Donald A. Williams

SOIL and water conservation are basic to preservation of our whole out of doors.

The outdoors is made up of land and water and the plant and animal life they support. Concern over outdoor preservation has mounted in the wake of rapidly growing population pressures. The best attainable land use and water management are essential to maintain land space and clean water to meet the multiple demands for farming, for wildlife and recreation, and for urban, industrial highway, and other essential purposes.

In land, and water, man can destroy something he has not the power to create. In land and water he can alter or modify, for better or for worse, those resources upon which he is totally dependent. This power we have to build or to undermine, or even destroy, our heritage of land and water resources lays a special responsibility upon every one of us, whether we dwell in the countryside or within corporate limits or suburbs.

While we drive on in the exploration of outer space, we cannot gainsay the fact that our own Mother Earth's thin covering of productive soil will remain for a long, long time as our principal source of food and fiber, our sports and recreation, and our everyday satisfying living. We have learned, however, that land is more than soil, and that soil is more than a medium for growing crops. We know that sun, air, rain, soil, plants, animals, and man all are linked together in a chain of interdependence. Land, we know, is the indispensable base of all of these elements of existence.

Land means many things to different people. For the first century of American settlement, our economic development was based largely upon exploitation of the new-found continent's soil, timber, wildlife, and mineral resources. Today, however, our land has taken on totally new values. These include the productive source of our food and other living essentials, watershed areas subscribing community stability and well-being, recreational space and wildlife habitat, wilderness or other unspoiled natural areas for the reflection and enjoyment of our Nation's citizens, and living and industrial working space for 185¾ million people who are increasing their numbers by some 3 million each year.

It is fundamental to our democratic system, as well as to an orderly approach to conservation and wise use of our land and water resources, that people exercise their inherent right to decide how they wish to use these resources. Land uses do not have to be exploitive. They can be in full harmony with the public interest, and with the capabilities of the land.

The fact that there are uses of land in sharp competition with one another further complicates an already complex relationship which we need to understand more fully. The solution lies in closer cooperation between such groups as farmers' soil conservation districts and county, city, or other planning organizations. It calls for more and more attention by urban people to what is happening on the farmlands that surround the city.

In this dynamic age—this age of space exploration and exploding population—we must not forget the fundamentals of conservation that underlie good land use and conservation. They include use of full facts about soil, water, plants, and people, and the interrelationship between them as a basis for land and water management. They relate to the need for proper combinations of treatments and uses encompassing the sciences of soils, agronomy, forestry and ecology, biology, hydrology and hydraulics, economics, and others that are interwoven into what we recognize today as soil and water conservation technology.

Most importantly, they include the principles of human interests and needs—recognition of the fact that the people who use the land, whether for farming, hunting and fishing, or camping, are the key to its future fate. One of our great needs today and in the future is to apply on all lands—farm and pasture lands, forest lands, wildlife and other recreational lands—the same basic principles that have proved sound in more than a quarter of a century's experience in soil and water conservation.

Therein we have the best assurance of the maximum possible preservation and future enjoyment of all our out-of-doors.

People Make Lakes "Grow Old"

Conservation Rejuvenates Them

By Nils P. Dahlstrand

LITTLE St. Germain Lake in northern Wisconsin's Vilas County vacationland has started to show the effects of old age. The cause is people, more people, and still more people!

Take a lake today, build a few access roads and paths, cut trees and clear areas for cottages, clean up the debris, and install septic tanks—and you've taken a hundred years off of its life. But then raise and lower the water level periodically, fish almost continually for the walleye, bass, or prized musky, clear the shoreline for bathing beaches, churn up the water with power boats—and this same lake becomes "prematurely gray."

The Paul Meyers' beach on Crawling Stone Lake. The beach line originally was at the stones at the base of the birch trees.

Geologists say a lake is but a temporary feature of the landscape, even under natural conditions. The thousands of swamps in northern Wisconsin attest to this fact. These swamps, once filled with cool, clear water, have gradually filled up with dead vegetation. It may have taken a few thousand years, but the lakes are gone while the surrounding hills remain.

When human "improvements" are made upon Nature's liquid gems, the aging process is speeded up. Soil washing starts along the paths and slopes to the lake, wave erosion chews at the beaches, and weeds and algae take over where the water was clear before.

Property owners on Little St. Germain Lake, which is typical of thousands of lakes, became concerned about the fate of their lake and have taken steps to do something about it. Through their lake improvement association, they took a hard look at their problems and decided upon an attack using modern soil conservation methods to reduce erosion and silting. In addition to erosion problems confronting the committees, there were such other problems as algae, weeds, fish propagation, safety, wildlife, lake property improvement, and sanitation.

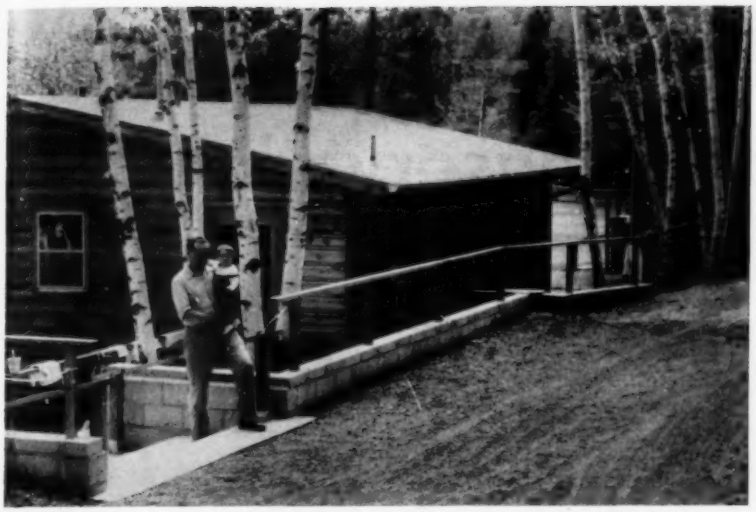
To check soil erosion, property owners enlisted help of the Vilas County Soil Conservation District and the assisting Soil Conservation Service. Intensive use of shorelines oftentimes leaves the soil wide open to erosion. Association President George Jackson has a good example of what erosion can do—a newly formed weedbed at the end of his dock.

"Runoff water from heavy rains used to wash out my boat access road leading down to the lake," he recalled. "Soil from the road was washed into the lake next to the dock, leaving the water muddy for a day or so after each heavy rain. Soil particles settled to the bottom and gradually formed a seedbed for water weeds to grow."

The weedbed, about 40 feet across and 30 feet from the shore, was like an island surrounded by a weed-free, sandy shoreline. Jackson built a diversion terrace, which acts as an eave trough to stop the erosion, catching the runoff water above the beach and leading it aside to a grassy area where it

Chief St. Germain statue—20-feet tall—looks down upon officers and directors of Little St. Germain Lake Improvement Association. (L to r., front: George Jackson, pres.; Martin Pietz, pres.-elect; rear: Ray Ramminger, Sam Glick, secy., Cecil Ray, Art Alexander, and Fred Stutz, treas.)

Note:—The author is work unit conservationist, Soil Conservation Service, Rhinelander, Wis.



Ray Ramminger and son, David, on steps that serve as drop spillway to lower storm runoff water to lake level without eroding the soil.

empties into the lake. The boat access road won't wash out again!

Said resort owner Ray Ramminger:

"Our association has a lot to do, and we're just getting started. This lake doesn't belong to us, but since we own the land around it, it's up to us to take care of it. We're trying to do as much as we can ourselves, but we also want all the help we can get."

He and the association are drawing upon the help of different agencies—the Wisconsin Conservation Department, the State Extension Service, the local soil conservation district, and the Soil Conservation Service.

Ramminger is convinced that all the interrelated problems—fish, weeds, algae, erosion, and others—have to be attacked simultaneously.

"These organizations work mostly with farmers in other counties," he pointed out. "But we're farmers,' too, in a way. That lake out there is our farm. The crops are fishing, boating, swimming, and water skiing. And the land around it yields crops, too—deer, ruffed grouse, and northwoods beauty."

He feels that erosion problems are just as serious here as they are on high-priced farmland.

Resort owner Cecil Ray, raised on an Indiana farm, used familiar tile drainage to tap a seepy area next to one of his cottages.

"The foundation used to heave every year, and it was always wet around the cottage," he said. "Now she's dry as a bone, and more sanitary, too."

Many other lakes in the State are having the same troubles as those of Little St. Germain Lake. For example, on Crawling Stone Lake in southwestern Vilas County, the Paul Meyers licked their resort erosion problems by seeding grass on bare slopes above their beach, changing them to green carpets, and cutting down silting along the beach.

Their problem now is to maintain their beach against wave erosion. High water, strong winds, and fast-moving power boats direct a powerful force against the sandy beach. Even on calm days, the power boats alone can throw up waves equivalent to those generated by a 20-mile-per-hour wind. The answer to this serious problem, common to many lakes, hasn't been found, but the Meyers and many others are working on it. Meanwhile, more and more people in the recreational areas of Wisconsin are looking to modern soil conservation measures as a means to solving their soil and water problems.

Herring Bailed Out George Washington

Herring fishing is reported by the National Geographic Society as more than once having spelled the difference between profit and loss for George Washington's farming operations at Mount Vernon south of the Nation's capital.

In 1769, for example, the Society reported, a Virginia crop failure was offset by the sale of salted herring. As late as 1796, when he was president, Washington wrote to his estate manager: "I wish, as your prospect for grain is discouraging, that it may, in a degree, be made up in a good fishing season for herrings."

Salted and packed in barrels, herring was easy to ship to ready markets, the Society reported, adding that vast schools of the silvery fish flashed up the Potomac River past Mount Vernon every spring. Though Washington called them herring, they actually were alewives, a close relative. Alewives and shad still run up the historic river in the spring, and about 25 million pounds are netted in the Chesapeake Bay region.

Although, on becoming president, Washington was perforce an absentee landlord, he complained to his manager about damaged herring seines. As the herring season approached, Washington, an experienced fisherman, wrote his manager that fishing would be unproductive unless the weather grew warmer. He warned the manager to "secure a sufficiency of fish for the use of my own people from the first that comes, otherwise they may be left in the lurch."

He also kept up to date on market prices!

Young Campers Learn About Outdoor Conservation

By P. H. Bedanbaugh

EACH year in early June about 100 selected South Carolina boys and girls of early high school age prepare to attend a special week-long camp designed to teach them about the State's natural resources and the need for conserving them.

The South Carolina State Conservation Camp is sponsored by Garden Club chapters, Wildlife Federation chapters, and other conservation-minded organizations. As the importance of conservation knowledge is more widely realized, more and more organizations every year contribute to the funds to sponsor the campers.

The camp is held at Camp Forest in Cheraw State Park, where the soil, water, forests, and wildlife provide the laboratory and study materials for many of the class sessions, in which actual examples of conservation and the lack of conservation are studied, compared, and measured.

All the State resource agencies cooperate by providing teaching personnel to bring the latest management practices before the campers. Gordan H. Brown, education assistant with the South Carolina Wildlife Resources Department, coordinates the program and serves as camp director. Classes in soils and soil and water conservation are taught by P. H. Bedenbaugh, soil conservationist of the Soil Conservation Service assigned to the Chesterfield Soil Conservation District, the supervisors and cooperators of which have helped with the camp program.

SCD Supervisor Campbell McLeod of McBee, S. C., prepares an irrigation demonstration for State Conservation Camp boys and girls in McLeod orchard.

Conservation plan and soil capability maps of nearby soil conservation district cooperators' farms are studied before campers visit farms.

The campers learn how to identify soils and the land-use treatment for different soils and land-capability classes, and what soils contribute to plant growth and how they retain moisture for this growth. The boys and girls also learn about the problems of erosion and the different kinds of erosion like sheet and gully erosion. In interpreting this information, they learn how the wealth of their State depends upon the wealth of its topsoil, and what the topsoil produces.

The campers learn through demonstrations how different plants mingle together in plant communities. They are shown how water and good soil, or their lack, affect plants. They are taught how soil and water conservation affect

Note:—The author is soil conservationist, Soil Conservation Service, Chesterfield, S. C.

wildlife and, as a consequence, gain a better comprehension of conservation-management techniques.

The campers make trips to nearby Chesterfield district cooperators' farms, where they study examples of soil, water, woodland, and wildlife conservation. They also are told how these practices are planned and applied on the land as a part of a whole soil and water conservation plan, in accordance with the land's capability. As a result, many of the campers have said that they better understood how all of these resources are interdependent and interrelated in the chain of life.

As the camp week closes, the boys and girls prepare for receiving their diplomas by demonstrating their conservation knowledge and skills. A compass course directs them around an area of the camp; and at each station they identify the conservation problems that have made up a part of the week's instruction.

District Supervisor Campbell McLeod said: "I will always be glad for the camp group to visit our farm and see our contour orchards, our conservation irrigation plan, and our pasture management program. I will also always be happy to show them irrigation application."

District Cooperator L. C. Wannamaker is another who has welcomed conservation campers to his beef cattle farm, where they are shown examples of soil, water, woodland, and wildlife conservation. With the aid of an enlarged conservation plan map and the soil and land-use capability map of the Wannamaker farm, the campers can understand more readily the mechanics of a soil and water conservation farm plan.

Many of the boys attending camp are Boy Scouts, and have had a previous interest in conservation. These boys are given an opportunity to develop their interest further, and to work toward Merit Badge requirements in soil and water conservation.

Connecticut "DuckMan"
Bucks Wildlife Shutout

By Theodore W. Pawlowski

DAIRYMAN Edmund S. Ryan is perhaps best known as the duck man by the folks around Beacon Falls in Connecticut.

Ryan, a cooperator with the New Haven County Soil Conservation District, operates a 150-acre dairy farm with 65 milkers. His conservation farm plan, worked out with the help of Soil Conservation Service technicians, has been his field guide for more than 6 years. His conservation system includes sod waterways, tile drainage, diversion terraces on his improved hillside pastures, and a well kept, 1-acre farm pond.

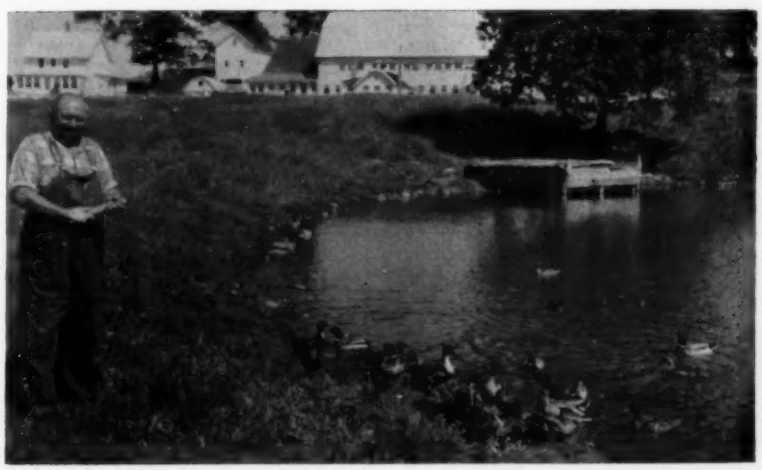
He won the "Outstanding Conservation Farmer of New Haven County" award in 1959. But Ryan carries conservation even further than the good use of his soil.

"Wildlife conservation is important, too," he says. "Farmland is the last place for wildlife here in the Northeast. Closing in of open land with homes is taking over much of our natural wildlife areas."

Ryan and his farm manager, Wilbur Weed, a supervisor in the New Haven County district, do their bit to help wildlife survive in the area. Together, they hatch 60 mallard eggs in an incubator in the cowbarn each year. In addition, they built a nesting house near the pond, where 80 or more eggs are hatched. The young birds are kept in the barn 6 to 8 weeks before being released on the pond, and are cared for as conscientiously as the best-producing cow in the milking herd.

A familiar sight on the farm is the mallards and their young marching from the barn to the pond. From there they spread out over the countryside, and can be seen flying over a large part of the county. Many return to the Ryan pond at regular intervals for food. A few dozen can be found on the pond almost any time.

Note:—The author is area conservationist, Spencer, Iowa, Soil Conservation Service, formerly work unit conservationist, Wallingford, Conn.



Ed Ryan and some of the mallard ducks he raises on farm pond near his barns.

Room For Outdoor Development Demonstrated in Wide-Open West

By D. S. Winn

EVEN the wide-open West has not escaped the pressures of urban population concentration and the need for preserving or developing recreational and other land space. A few miles west of Ogden, Utah, for example, where the urbanization movement is particularly active, an area is being developed into a duck hunters' haven through soil and water conservation action.

Between the Ogden Bay and Bear River bird refuges, the Basin Land and Livestock Company has a ranch headquarters surrounded by lands grazed by sheep during the spring and fall each year. In addition, a small part of the land is farmed, largely to produce hay for winter feed. Last year, Joe Jacob decided he was going to try to do something about improving hunting conditions.

He was especially interested in creating more accessible duck hunting areas as just another part of the overall improved land-use and conservation program being placed on the lands of this ranch. The Weber Soil Conservation District supervisors agreed to provide the technical help to develop a trial program.

Soil Conservation Service technicians working with the district and Jacob went over the ranch areas and selected a 10-acre tract that could be improved. It had deep, medium-textured but imperfectly drained soils, and black alkali, saline salts, and a high water table. The native vegetation was largely saltgrass. Part of the selected and adjacent areas had been farmed successfully to small grains and grass-legume hay. Irrigation for the farmland was supplied by water pumped from a slough. The water easily could be diverted to the area to be ponded.

A dike along the northeast side of the area, equipped with control outlets, adequately served for water control during irrigation, water

Ducks over waterfowl development diked, planted to millet, and flooded before hunting season.

Joe Jacob draws bead from hole-in-dike blind on ducks approaching to land and feed on flooded millet in background.

Note:—The author is area conservationist, Soil Conservation Service, Logan, Utah.

Dike built to impound irrigation water during hunting season.

ponding, or surface drainage operations. The dike was 4 feet wide on top—wide enough to enable hunters to move along it with safe footing.

Water application and hunting access were facilitated by a few supplemental dikes, which also served as border dikes during irrigation and as walkways during the hunting season.

A seedbed was prepared in late June, and 20 pounds an acre of duck millet was drilled. The seeded area was irrigated, and excess water was drained away at 9- to 10-day intervals throughout the season, until late September. A heavy seed crop, estimated at a ton to the acre, was produced; and enough seed fell to the ground to provide the next year's seed.

Ducks, geese, and swan were seen on the area during the early part of the season; but as the year neared its close, ducks were the only waterfowl observed.

Jacob's experience during this first year led him to proceed with the development of an adjacent area for improved hunting. He had sound reason for doing so, because his friends and neighbors agree of his initial development that the "hunting was good!"

Conclusion of a successful opening day on waterfowl development. L. to r. Earl Olsen, Joe Jacob, Joe Henriod, and Brooks Madsen.

NEW USES FOR OLD FARMS

By Gordon S. Smith

FARMING in West Virginia's Alleghany Mountain country is changing as small hillside farms abandoned as unprofitable in past decades are being revived to serve as living sites for outdoor-minded businessmen. These ex-farms, particularly when they are situated along natural trout streams, are ideal fishing and hunting areas, if properly developed.

Joe Bonsall's Rainbow Farm at Zenith in Monroe County is a typical example of this changing land use. Bonsall, a Charleston businessman, bought two adjoining abandoned farms totaling 68 acres near the headwaters of Dropping Lick Stream at the foot of Peter's Mountain. The West Virginia turnpike, running southeast from Charleston, makes the area an easy drive from the city.

The stream still supported a generous quantity of good-sized brook trout. Steep slopes of the little valley were raw from misuse in many places. They could be protected with wildlife food and cover-pro-

Bonsall's 69-acre farm includes two ¼-acre trout-raising ponds and a ¾-acre bass and bluegill pond.

Note:—The author is field information specialist, Soil Conservation Service, Upper Darby, Pa.

Alvin McCorkle and son, Alvin, Jr., land a trout (see next picture). Only guests—no paying customers—are invited!

ducing vegetation. The place was ideal for Bonsall's plans.

He needed technical help.

He found it through the Greenbrier Valley Soil Conservation District. Soil Conservation Service technicians working with the district developed a plan with Bonsall, through which steep slopes, shallow soils, and wet bottom lands, though poor for crop farming, could be adapted to wildlife plantings and the building of trout ponds. A nearby cave, the source of Dropping Lick Stream, gave a good yearlong flow of cold water with a high alkaline factor, important ingredients for healthy trout reproduction.

The head of the Federal Fish Hatchery at White Sulphur Springs was called in, to help work out a plan that included three ponds, two raceways, three small dams, and a 2,000-foot underground pipeline to supply the ponds and raceways. Two small rock dams built along the stream added extra fishing pools. Native trout easily could run past these dams to spawn upstream. The raceways, 75 feet long and 4 feet wide, could be sealed off in compartments. Control valves there could keep the water at desired levels. Fingerling rainbow and brook trout are kept here from spring to fall and then turned loose in the two trout ponds.

The other wildlife part of the farm plan was equally as unique as Bonsall's trout pond system. Upland game usually found sparse pickings during the long mountainside winters. A variety of food and cover-producing plants was selected to attract game birds and animals to the farm. Bonsall's farm manager, Herbert Shires, cleared five areas of about 1 acre each. An annual mix of buckwheat, soybeans, milo, sorghums, and kaffer corn was seeded in these areas to give wildlife added food. Dogwood trees in adjacent areas were encouraged by clearing out poor-quality trees nearby. Black Haw, Hawthorn, Wild Grape, Sumac, honeysuckle, and other shrubs added along the edges and in odd areas on the farm soon would give good food and cover in times of deep snow.

Bonsall planted more than 2,000 Scotch pine, Norway spruce, and Chinese chestnuts on the steep hillsides to stabilize the old scars and to give winter cover and food for his wildlife, and to yield a money-making timber crop in a few years.

Access roads through the woods

And here's the proof!

and the pond areas were seeded with Kentucky 31 fescue, and were well fertilized to form a good cover and to stop erosion.

Game birds and animals already are beginning to make the Bonsall farm their home as cover grows; and the ponds are producing rainbows and brooks in sizes that would give any man a yen to cast a fly onto their waters. Fall hunting in Rainbow Farm's hills also has become a real challenge in the well-planned protective cover. These wildlife-recreational "crops" are making better use of local soil and water resources than oldtime erosion-producing crop farming did.

Hiking in. More than a mile of access roads, seeded with Kentucky 31 fescue, have been stabilized on Bonsall farm.

More Ducks—Birds—Beauty

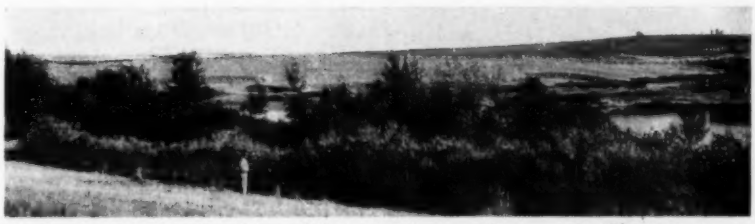
Bare Plains Area Transformed

By Leo GrandPre

IN less than 10 years a group of forward-looking North Dakota landowners turned a stretch of barren land into a scene of beauty and abundant wildlife.

In accomplishing the feat they had a strong assist from the Western Soil Conservation District and the North Dakota Game and Fish Department. But the biggest share of the credit must go to the men whose vision and energy, plus a willingness to cooperate, made such a marked change in the Indian Springs community in Billings County.

It all started with plantings of wildlife cover, trees, and shrubs on the Alfred and George Kadrmas farms in 1951. Before long, the Kadrmas' neighbors, Paul Krush, George and Laudie Jilek, Frank Gresz, and Helmer Krough, liked what they saw and followed suit. Each of the six farms has a wildlife planting, plus windbreaks and wildlife travel lanes, totaling 139 acres.



Stockwater dam bordered by wildlife planting on George and Alfred Kadrmas land.

The Game and Fish Department, foreseeing the value of such plantings in this part of the State, called upon the soil conservation district to plant the trees and shrubs supplied by the Department, which also did the planning. Technical and supervisory assistance was provided by the Soil Conservation Service.

Wildlife has increased since the concentrated plantings of trees and shrubs were completed in 1954. George Kadrmas reported that in 3 years he has observed many coveys of gray partridge and pheasants in his plantings, which offer ideal cover in winter.

Alfred Kadrmas says that wild ducks like to nest in a wildlife planting on the edge of his stockwater dam. Pheasants, partridge, and insect-eating birds are there in abundance throughout the year.

"You should have been here before," the Kadrmases add. "It was barren, to say the least. Hardly ever did we see any of the wildlife observed today. We think it is great."

The other farmers involved enthusiastically echo the Kadrmas brothers' sentiments and take pride in caring for their plantings.

In addition to the benefits to wildlife, the plantings protect farm buildings and yards from drifting snow. Livestock feedlots also get good protection during winter. Meanwhile, the success and beauty of the Billings County tree and shrub plantings have been an incentive to others in western North Dakota.

George Kadrmas farm with 225-foot-wide wildlife planting (left center) and windbreaks protecting farmstead and feedlots.

Note:—The author is conservation aid, Soil Conservation Service, Dickinson, N. Dak.

Watershed Lakes and Farm Ponds

By Carl Bro

Swimming.—South Carolina.

RECREATION and wildlife benefits from small-watershed protection and flood prevention projects are increasing markedly as more multiple-purpose projects are developed in local communities over the country.

The Federal Government, which pays all the structural costs of the flood-prevention part of a project —except for land easements and rights-of-way, administration of contracts, and water rights—also may pay up to 50 percent of the cost for fish and wildlife development. It also cost-shares on irrigation and drainage developments, and makes loans for municipal water and recreation developments, no part of which is paid for by the Federal Government.

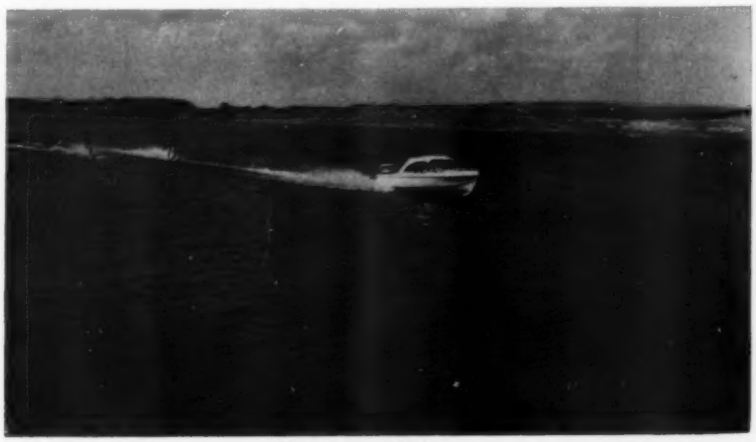
In any case, as multiplied experiences of communities in many States testify, lakes formed behind watershed dams, and other improvements in the watersheds are providing a wide variety of fishing and other wildlife and recreational opportunities to urban and rural people alike. So are the steadily increasing farm and ranch ponds and reservoirs, now totaling about 1,140,000 million built in soil conservation districts, also with Soil Conservation Service technical help.

Examples of these important supplemental benefits are unnumbered. For instance, a study of 117 flood-prevention structures in three States disclosed that the average yearly number of individual visits to those used for recreation was about 2,100 in Arkansas, 700 in Kentucky, and 5,000 in Maryland.

Take Kentucky: One of the greatest benefits recognized locally from structures in the Plum Creek pilot watershed in Shelby, Spencer, Bullitt, and Jefferson counties is the increased fishing, by people from Louisville and other communities. They also are used each year by a conservation workshop held by Eastern State College, and have been used by Boy Scouts. One lake on the North Fork of Rough River in Breckinridge County has become a Kingwood community recreation center, with people catching good sized fish.

The Six-Mile Creek watershed in Logan and Franklin counties, Ark., has received nationwide attention for its performance as a flood-prevention and rural areas development project. Less publicized has been the fact that three of its lakes have been used extensively by Boy and Girl Scouts and other organizations for picnics, swimming, camping, and outings. All of the lakes are stocked with fish, and fishing clubs have been organized on two of them.

Says Executive Secretary Warren D. Fairchild of the Nebraska Soil and Water Commission: "Prior to the advent of the small-watershed program, our State Game Commission was constructing many reservoirs for boating and fishing. They were costing several hundreds of thousands of dollars each. Now, by cooperating in the small-watershed program, we can acquire many comparable recreation areas for our State at a very nominal fee."



Boating.—Oklahoma.

Note:—The author is watershed program specialist, Soil Conservation Service, Washington, D. C.

Boon to Recreation and Wildlife

By Carl Brown

Iowa is one of the States providing many examples of similar out-of-door benefits of watershed project developments. For example: In the Deer-Run Community watershed, as many as 100 people have used the Ed Monson Lake for summer fishing, swimming, and picnicking some days, and for duck hunting and ice skating in winter. After being stocked with fish for 3 years, ponds in the Harmony watershed east of Logan began supplying good fishing in 1961. Residents of Dunlap are depending upon a 10-acre lake in the Mill-Picayune watershed for fishing and swimming.

Also in Iowa, the Petersen-Lapke dam in the Mill Picayune watershed in Shelby, Harrison, and Crawford counties is supplying fishing, swimming, boating, hunting, and wildlife habitat; and the Assman-Evans Lake likewise is used extensively for community fishing, boating, and other recreation. Water impoundments in Iowa's Mortheson watershed in Cherokee County are stocked with fish, and an estimated 2,000 to 3,000 ducks have been observed at one time on the water above one of the larger dams.

Local people have enjoyed good duck and geese hunting at a watershed impoundment in the Clark watershed in Cherokee County. It also is stocked with bass, bluegill, and catfish. In the Robeson watershed in the same county, the Robeson flood-prevention reservoir, likewise stocked with fish, also provides waterfowl hunting; and the Vollmar dam, in addition to providing fishing and hunting, has become a frequented recreational area.

Down in Louisiana's Upper Sabine Soil Conservation District, businessman and district supervisor Ott Williams yielded to the lure of the out-of-doors to the extent of giving up his business in town and moving out to a year-round "summer" home he had built on a bluff overlooking the State's first flood-detention reservoir, for which he had given an easement!

Picnicking and camping.—California.

Fishing.—West Virginia.

Oklahoma is another State experiencing a watershed recreational and wildlife boom. To cite one, Lake Humphreys, near Duncan: Advantages such as boating, fishing, and hunting prompted industries interested in the after-hour activities of their employees to consider Duncan as a prime location. When the city opened the lake for recreation, the modest fees collected in one day paid for the caretaker's new home!

Cheyenne, Okla., established a city park on one of the flood-detention sites in the Sandstone Creek watershed. A sportsmen's club leased another reservoir. Boy Scouts established a camp, and watershed reservoir sites throughout the area are used for meetings by patriotic, civic, church, and farm groups. One Sunday, 40 boats cruised on a 158-acre flood-prevention reservoir in the Washita watershed near Weatherford.

And down in Texas' Sulphur Creek watershed at Lampasas, several of the nine pools stocked are being fished, and one reservoir is used for boating and other recreational uses. A church and shop-

ping center were built on the banks of Johnson Draw at Ozona, previously subject to heavy overflow; and a motel was built on the banks of the arroya in a former heavy-overflow area in the Dry Devil's-Lowery's Draw at Sonora, with the local people enjoying commensurate recreational and related benefits.

From North Dakota to Virginia, the watershed-farm pond story runs true to form: Thus a recreational development at the Renwick Reservoir in the Tongue River project at Cavalier, N. Dak., is serving that purpose well there. In Virginia's widely publicized Mountain Run watershed, the city of Culpeper, Va., found its recreational space for boating and fishing multiplied by its watershed dams. It is developing the first park ever established in the county, at Mountain Run Lake.

Out in Kansas, State Game Protector John Spence had this to say about structures in the Little Delaware-Mission Creeks watershed in Atchison, Brown, and Jackson counties—all stocked with fish, and with grass planted for erosion control and to provide cover and nesting areas for wildlife:

"The watershed has provided an adequate and constant supply of water so necessary for the maintenance of an abundant crop of wildlife, either game or fish. The ponds have been a source of good fishing, and also the holding action of runoff water has prevented the drowning of small birds and animals in the low-lying areas."

In Illinois' Tiskilawa watershed in Bureau County, the Mennonite church has leased a structure site and is developing it into a camp available to church groups of all denominations. And in the Old Tom Creek watershed in Henderson and Warren counties, a noticeable increase in wildlife has been reported. One 20-acre lake has been leased by the Izaak Walton League for recreational use.

In adjoining Indiana, in the Elk Creek watershed in Washington County, a 46-acre lake was formed behind one of the structures. The State Fish and Game Division of the Department of Conservation bought approximately 250 acres around the lake, for development as a public recreation area for the community.

A floodwater-retarding structure built at the outlet of Swan Lake in the Shakopee Creek pilot watershed in Swift, Chippewa, and Kandiyohi counties, Minn., created

Ice skating.—Massachusetts.

a permanent water area so beneficial to wildlife that the local Gun Club bought more shoreline land and installed additional wildlife measures. As a result of improvement along the Chippewa River in the Mud Creek watershed, the city of Benson was able to improve a park area adjacent to the channel, including a picnic area and softball diamond and a relocated and improved golf course.

Stream pollution abatement and related health and other benefits are included among the small-watershed development contributions to a cleaner and more rewarding American out-of-doors. Washington, Ga., for example, built a sewage treatment plant on the headwaters of the Rocky Creek watershed project, after watershed farmers had urged the city to quit dumping raw sewage into the stream before the channel improvement was carried out. And in the Sautee Creek watershed in that State, the tangible benefits have included, in addition to the provision of campsites at one reservoir to the Yonah Girl Scout Council and the Athens Presbytery, the elimination of health hazards, beautification of the countryside, and the attraction of suburban development.

So it is that, across the Nation, a more rewarding, more beautiful, and more healthful out-of-doors all are resulting from these farm and watershed soil and water conservation achievements.

Land and People

A significant meeting on soil, water and related resources was the National Conference on Land and People called by Secretary of Agriculture Orville L. Freeman in Washington, January 18. Nearly 500 leaders from many fields of public interest in the 50 States discussed land, water, forest, grass, wildlife, and recreational resource policy and use as reported upon by a Land and Water Policy Committee the Secretary appointed in August 1961.

"The objective of harmonized and integrated multiple use is increasingly becoming the guiding principle of management for much of our public and private land and water resources," the Committee reported, adding: "The whole problem of encouraging more diversified use of public land by the owners, and of making certain types of private land available for public use under terms attractive to owners, is one of the new frontiers of land policy . . . Outdoor recreation is one of the increasingly significant types of multiple uses."

Secretary Freeman said: "Every American wants to see the land used efficiently and effectively. Our national purpose is to use resources; it is not to have land lay idle."

Colorado Tree Plantings Multiply Game and Song Birds

By W. S. Swenson

UNTIL recent years there were parts of Colorado in which a motorist could travel long distances without seeing more than an occasional tree or more than a few kinds of birds.

Today, thanks to the cooperative efforts of the Colorado State Game and Fish Department and the State's soil conservation districts, there are more than 2,000 acres of tree plantings in these once treeless areas. Game and song birds by increasing thousands are making good use of these plantings. In some areas, tree squirrels and deer also use them. Another important consequence of this cooperation is the saving of money and a reduction of overlap in tree-planting programs.

A few years ago, both the Colorado Game and Fish Department and the farmers' and ranchers' soil conservation districts were pressing ahead with the planting of trees in the same areas. Although their purposes were almost identical, the accent of one was to provide wildlife with food and cover and to give wind-erosion protection, too, and of the other to provide wind protection, with wildlife as a secondary benefit.

Representatives of the soil conservation districts, the Soil Conservation Service, and the Game and Fish Department got together on a new approach to the problem. For example, where the Game and Fish Department provides tree-planting stock for windbreaks and other purposes, and the planned plantings are beneficial for game, the landowner is informed that planting stock can be furnished at no cost through the Department. Trees from the Game and Fish Department are paid for partly with Department funds and partly with Pittman-Robertson funds, administered by the Fish and Wildlife Service.

Russian olive planted about 1940 form outside row of windbreak.

Pheasants in windbreak planting in Logan County in northeastern Colorado.

Farmers cooperating with soil conservation districts prepare the land, plant the trees, and tend them. The districts provide tree planters where they are available. They also furnish trucks to haul planting stock to the cooperators.

In the first year of the program, 1956, requests for trees totaled about 120,000 seedlings. By the 1960 planting season, 211,000 seedlings were furnished to district cooperators.

A recent field checkup by Soil Conservation Service and Game and Fish Department technicians showed that the farmers are doing an excellent job of planting and tending the trees.

In the 5-year period, 875,000 trees were planted under this program, and were expected to pass the 1-million-tree mark in 1961.

Among the trees adapted to eastern Colorado, an area plagued with recurring drought, where trees have to be hardy to survive, are Ponderosa pine and Rocky Mountain juniper, both difficult to establish. The Game and Fish Department, in

Note:—The author is woodland conservationist, Soil Conservation Service Colorado Springs, Colo.

order to overcome this difficulty, supplies virtually all conifers in tar paper containers. Planting potted evergreens has done wonders toward establishing these trees. Almost one-third of the trees in this program are now evergreens, and the percentage grows each year.

Nursery stock comes from commercial and Clarke-McNary nurseries. The nursery at Colorado State University pots evergreens on a contract basis..

At the outset, it was decided to provide only those species of trees that had been proved suited to the climate. Most of the seedlings provided are squawbush, skunkbush, Caragana, Russian olive, Siberian elm, hackberry, Rocky Mountain juniper, and Ponderosa pine. Other species of seedlings planted in lesser numbers include sandcherry, plum, chokecherry, green ash, honey locust, and spruce.

Trees furnished to the soil conservation districts can be used for farmstead or field windbreaks, or for wildlife food and cover plantings. Many wildlife plantings are made in odd areas and around water developments.

Almost any tree planting will be used by game birds, and the plantings in Colorado show their widespread use. Hunters, who now head for the tree belts on opening day of the pheasant season, seldom are disappointed.

Fish and Fowl and Fine Black Angus

By Burrell D. Osburn

FISHING and waterfowl hunting are combined with good pasture production in a multiple land-use management system worked out by Wapato Soil Conservation District Cooperator Carl Weisbrod in central Washington.

At Weisbrod's request through the district, the Soil Conservation Service helped him determine the feasibility of flooding 80 acres of native and seeded pasture on his farm with water from Toppenish Creek that bisects the acreage and supplies the fishing. After a detailed topographic survey was made, the system selected out of three considered, provided for three dams and a series of dikes to hold water, with water released from the flooded area by means of pipe outlets to the dry pastures at lower elevations. The dams were constructed so as to allow for raising and lowering water by means of "flash boards." A strict control is used to regulate irrigation water.

This area is flooded to irrigate pasture in summer and furnish wildlife habitat in late fall. (Note duck blind in background.)

Toppenish Creek, with wooden dam and earth dike in background and as yet unseeded sloped banks in foreground.

After the pasture and irrigation season, the dams and dikes are used to flood the same area, and Weisbrod then leases the area to waterfowl sportsmen for the hunting season. He points out, however, that the duck hunting and fishing are subordinate to the production of grass for his high-quality Black Angus herd. Weisbrod feels that his grass-reseeding pasture management system during the next few years will increase the cattle carrying capacity many times over.

He has considered developing the same type of multiple land-use conservation plan on an additional 40 acres adjacent to his other tract.

Note:—The author is work unit conservationist, Soil Conservation Service, Toppenish, Wash.

Fishing Tourists Need Bait

N. Mex. "Fish Farmer" Obliges

By Ralph N. Bell

R. T. "BOB" GAGE calls himself a "fish farmer." Any day, at any time, you likely will find him in his "fish house" grading and sizing minnows. From an 8½-acre farm on the Gallinas River north of Las Vegas, N. Mex., Gage has been a principal supplier of minnow bait to fishermen at the Conchas Dam near Tucumcari.

Gage, in comparing his minnow production business with conventional farming, commented:

"This is an operation that must be watched as carefully as the feed ration for livestock. Individual attention is required for each fish pond, because of different sizes of ponds, different water temperatures, and the differing mineral content of stream and spring waters."

His working tools are fish traps, seines, and his boots.

"This is a business where you can get your feet wet all right," he explained, "a business that requires patience, persistence, and constant learning."

Gage became interested in the minnow business while he was with the New Mexico Fish and Game Department in 1947 and 1948. He saw the business opportunity of minnow production as sport fishing mushroomed during post-World War II years. He started his minnow business, with Las Vegas as his headquarters under a permit from the Department to trap and seine nongame fish minnows from the lakes, ponds, and streams of northeastern New Mexico.

The demand for minnows is generally April to October. The annual tourist load of 250,000 or more to the Conchas Dam keeps Gage plenty busy during the fishing season. At the start, the streams, lakes, and ponds of this area provided him with his minnow supply for marketing. As the fishing pressure grew and more and more streams were stocked with game fish which cannot be trapped or seined, Gage started developing his fish farm. Included were a water-supply pond, a "growing" pond, and four "working ponds."

As a cooperator of the Gallinas-Tecolote Soil and Water Conservation District, he decided upon a basic conservation plan calling for improvements to existing ponds, development of a well, establishment of a water-circulation system through the minnow-hardening and growing ponds, fish pond fertilization, and the conversion to grass of croplands used in his operations. He had guidance from Soil Conservation Service technicians working with the district.

Gage's goal is to increase his production from about 10 percent of the minnows he markets to 100 percent. The main species grown are "fat heads," with a few "shiners" on the side. The minnows are wholesaled to bait concessions at the Conchas Dam.

In past years, he fertilized his growing pond with barnyard manure but was not satisfied, because of the residue and gas produced by the decomposition of organic matter. After he switched to 16-20-0 commercial fertilizer, his minnow production was the highest since he started. Although his success resulted from pond fertility alone, Gage's 1961 program called also for feeding the minnows a supplement of regular growing mash like that fed to poultry.

"I feed as much growing mash as many poultry producers," he remarked. "That is way I call myself a 'fish farmer.'"

Bob Gage and Work Unit Conservationist Ralph Bell of the SCS discuss minnow pond fertilization and other improvements.

Note:—The author is work unit conservationist, Soil Conservation Service, Las Vegas, N. Mex.

Conservation Watershed Management Restores Creek Flow

By Don Wilbert

RIGHT in the middle of a string of dry years formerly intermittent Johnson Creek in Wyoming became a live and yearlong running stream.

No one locally can remember when the creek had run water yearround. It always flowed a lot of water—some of it dirty and muddy—for a short time in the spring, but tapered off to nothing by mid-August or early September. There are a couple of springs that never dried up completely, but these never ran enough water to reach the highway crossing during the fall.

The place is the Sybille Experimental Unit operated by the Wyoming Game and Fish Commission. In 1948, the Commission bought a ranch in Wheatland Canyon, to carry on research in game animals and birds. One of the first things Floyd Blunt, biologist in charge, did was to apply to the Wheatland Soil and Water Conservation District board of supervisors for technical help in developing the unit. The application was approved and, through the district, Soil Conservation Service technicians prepared soil capability maps and planned land-use maps which Blunt refers to regularly in arriving at his land-treatment decisions.

At the lower end of the ranch, the Wheatland to Laramie highway crosses Johnson Creek which joins Sybille Creek. Virtually all Johnson's Creek's drainage area is on the research unit. At that time, the hills were almost bare. It was 1952 before Blunt got money to start replacement fencing of the 2,500-acre Johnson Creek area, to stop cattle drifting in from surrounding pastures. There has been no grazing by domestic livestock since.

Blunt and "research assistant."

A series of dry years began in 1953, when the fencing was completed, and lasted through 1958, except for 1957. In spite of the below-average precipitation, Blunt noted a gradual increase in the length of time the stream flowed in 1954 and 1955. Then, in 1956, the stream flowed all fall and winter—and it hasn't quit flowing since.

In fact, the flow seems to be getting stronger each year. In the fall of 1960, for example, the creek was running *more* water at its confluence with North Sybille Creek than Sybille Creek was, even though Sybille Creek has a drainage area at least 15 times that of Johnson Creek!

Johnson Creek has not been muddy in the past 4 years, even when hard rains hit the area; but Sybille Creek has become a muddy torrent

Confluence of Johnson and Sybille creeks today.

Note:—The author is range conservationist, Soil Conservation Service, Riverton, Wyo.

on several occasions and runs high and muddy for 30 to 60 days each spring. Johnson Creek used to do the same thing but now carries clean, clear water even when it runs higher in the spring. That is because its watershed slopes are covered with mid-grasses, and the bottoms are growing up to basin wildrye and other good grasses. The browse plants are healthy and vigorous. The vegetation all has recovered naturally, in spite of drought, and causes slower, but steadier, release of water into Johnson Creek.

The area also has improved as deer range. Blunt believes there are at least 200 deer on the Johnson Creek pasture, or about 50 deer to the section, or 1 to every 13 acres.

Flood-Prevention Dam Brings Outdoors To the Kids

By Wayne M. Hypes

FLOOD protection and the building of better equipped citizens for the future are among the tangible benefits of one of the dams built in the South River watershed of the Potomac River as part of the nationwide flood-prevention program in 11 of the Nation's major river watersheds.

Working with the Soil Conservation Service, the Kiwanis Club of Waynesboro, Va., is providing camping facilities for 120 underpriviledged children each camping period in the South River project. The club has been working closely with city welfare officials and with the local United Community Fund for more than 15 years to make adequate camping available to deserving boys and girls.

The greatest problem that remained unsolved until recently was finding camp facilities large enough to accommodate more children, and with enough water for water sports. They now have complete camping facilities, including a modern kitchen, mess hall, separate barracks for the boys and girls, an administration building, and a large recreational area surrounding the 7-acre lake.

It all started back in 1954, when the Shenandoah Valley Soil Conservation District and the South River Watershed Association were getting easements and rights-of-way for the flood-prevention dams. But on dam site No. 4 (Pine Run) they were not able to get the required easements. It looked hopeless, and proposed dam site No. 4 was all but abandoned. Then the Waynesboro Kiwanis Club bought the 235 acres of land for $8,000 in 1958 and granted the necessary easement for building Dam No. 4. It was completed in 1959, with Federal technical and financing assistance made available through the Soil Conservation Service. With storage capacity for 544 acre-feet of floodwater, the nearly 50-foot-high dam has a 7-acre permanent lake.

Campers await their turn for a boat ride on 7-acre lake formed by South River watershed flood-prevention dam.

Flood-prevention lake before buildings were constructed on Kiwanis campsite.

Note:—The author is work unit conservationist, Soil Conservation Service, Staunton, Va.

Counselor (right) supervising swimming in flood-prevention lake. (Dam in background.)

The Waynesboro Kiwanians following through with their dream, and, with more hard work, immediately started building the children's camp, at a cost of about $15,000. By mid-June of 1960, the first group of 59 underprivilged children between the ages of 6 and 12 arrived for an experience they never dreamed could be theirs. They were followed by another group of 35 children on June 27.

For 2 weeks, these children received, for the first time, needed supervised outdoor recreation. Under the supervision of Truman Southall and his wife, as camp director and nurse, they learned and benefited from well-rounded summer camp life, including boating and swimming, and campfire programs on the waterfront.

At the close of camp in 1960, more sand was brought to the beach area; all buildings received another coat of paint, and the administration building was completed. The club planned continuing improvements, such as additional softball fields, basketball courts, an outdoor theater, more boats, and other equipment. Complete landscaping is planned, with emphasis on preserving as much of the woods and grove effect as possible.

The Kiwanians are making the camp available at a nominal maintenance rental fee to church groups, 4-H Clubs, Boy and Girl Scouts, and others seeking outdoor recreation and training.

Meet Mr. Beaver . . . Engineer and Conservationist

By Kenneth E. Riergard

THE headwaters of Big Meadow Creek in the forested lands of the Latah Soil Conservation District in northern Idaho tell a vivid story of the beaver as a natural-born "engineer" and water conservationist. The contrasting story of man's interference in this natural scheme is to be found there, too; but the score adds up to victory for the beaver!

The watershed of Big Meadow Creek lies in the central part of Latah County, occupying a part of the south slope of Moscow Mountain and covering about 2,000 acres of mixed conifer timberland. Spring runoff from melting snow and early rains swell the streamflow, and the steep gradient of the channel as it passes through the wooded section of the watershed produces a large volume of water moving at high velocity.

In the lower reaches of this section, on land owned by the University of Idaho, the beaver have built and maintained a series of dams which "stair step" the water down the channel. These dams are high; each one raising the water from 3 to 5 feet, forming a massive chain of rustic drop structures. Their spacing is close enough that the pools of slack water reach from dam to dam.

The effectiveness of these beaver operations as a real soil and water conservation measure is obvious from the stabilized condition of the

Note:—The author is work unit conservationist, Soil Conservation Service, Moscow, Idaho.

creek channel in this critical section. The overall water control achieved here, in itself, is tremendous. The late-season water storage from the dams is a significant factor in providing fish habitat, and livestock water in the watercourse below likewise is improved. The dams also have detained large amounts of silt from the mountain above.

About a mile downstream, the creek moves into a broad meadowland and enters a farmland section. Here, it formerly followed a rather shallow, medium-sized channel, that was largely sod covered and generally stabilized. The water was quite well confined during normal water level, and there was room for the high water of the spring runoff season. The beaver had built several low dams across this broad carpet of native sod. One of these dams still remaining is only 18 inches high, but it is more than 100 feet long, and as recently as 8 years ago, there also was an active beaver dam below this point where now there is only a ragged channel.

This is on land owned by David Sterner, a cooperator with the Latah Soil Conservation District, whose farm is 4 miles north of Troy in the central part of the county. He had just acquired the farm then, and was pleased at the way the beaver had the creek under control. He was anxious to keep them as his partners in soil and water conservation.

Sterner is emphatic in denouncing the unfortunate series of events that began when, unknown to him, trappers took out most of the beaver on his land, about 5 years ago. With the dams unattended by nature's engineers, high water broke down the dams; and, within a very few years, the present scene developed—a ragged channel, 6 feet deep, eroding and cutting farther back into the meadow floor each year.

"The beaver should never have been taken out in the first place," Sterner said in looking back over the situation. "I am sure that if they had been left to themselves, my creek channel would not be the mess it is now."

Meanwhile, the beaver stronghold on the University land upstream has withstood in remarkable fashion the buffeting of flash floods and the visits of the occasional trapper.

This story of Big Meadow Creek provides clear evidence of the value of the beaver as an upstream conservationist. Clear water flows over Sterner's well-tended dams in a completely stabilized channel. Floodwaters are stored in his ponds for partial release later, maintaining a more constant streamflow through the farmlands below.

Contrast this picture with gullied stream channels that are detrimental to the landowner and that result in the cutting away of valuable land, in silt deposition in the downstream section, and in lowered water tables and flash floods. Such erosion marks the beginning of difficult and costly maintenance work, calling for Soil Conservation Service technical help and other assistance.

Thus the beaver, Nature's original upstream engineer, proves by his works that he has an important role to play in our soil and water conservation program.

Still active beaver dams with excellent water control on upper Meadow Creek.

New Wildlife Film

"We Share This Land" is the title of a new wildlife film by the Soil Conservation Service.

Timed for a quarter-hour television showing, the film is in color and is filled with the sounds of wildlife. It is being made available for bookings through SCS State offices.

◆

The recently published National Survey of Fishing and Hunting by the Department of Interior reports that the American people have turned in ever-increasing numbers to the out-of-doors, with money spent on vacations having doubled in the post-World War II period. Use of automobiles by hunters and fishermen, for example, increased by about 26 percent between 1955 and 1960, to a total of 13¼ billion miles driven by outdoor sportmen in 1960.

Village Forest Conservation Means More Water For Power

By Lester Fox

BRIGHTER lights and fatter treasuries are among the rewards that Morrisville and other Vermont communities are realizing from their conservation programs on the wooded watersheds upon which they depend for electric power generation.

But for conservation on its watershed woodlands, the Morrisville village-owned power plants would at times fail to produce electricity for home, farm, and business. The village owns and operates two generating plants on the Lamoille River. In addition to taking care of its own needs, Morrisville supplies electricity to surrounding farms and communities.

During dry summer months, the Lamoille gets too low to maintain power production. To overcome that handicap, Morrisville, a cooperator with the Lamoille County Soil Conservation District, bought 5,934 acres of the Green River watershed near Garfield. Nearly all of it is in forest. The village cleared 625 acres and built a dam across the Green River in 1945-46.

Waterpower and beauty. Lamoille County Forester Arlo Sterner (left) and SCS Technician Eugene R. Fellows, Jr., look over Green River reservoir.

The 625-acre lake that the dam created is used to maintain the normal level of the Lamoille River into which the Green flows. As the Lamoille level drops in dry summer months, water is released into it from the lake. In that way, power production can be kept constant the year round, and the area retains its natural beauty for the enjoyment of city visitors. The lake drains 14 square miles, discharges a maximum of 1,000 gallons a second, and has a full capacity of more than 5½ billion gallons.

Village officials realized that, in order to protect the lake, they would have to manage the forest by modern scientific conservation principles, or the forest would deteriorate, the soil would erode, sediment would pile up in the lake—and sustained income from the woodland would be lost. They accordingly developed a conservation plan through the soil conservation district. Management of the forest helps regulate runoff of rain and snowmelt and lets the water soak into ground storage for steady, year-round release into the lake. Even the snow is contributing more water than it used to.

State foresters arrange for thinning and culling, and supervise planting and harvesting. Timber sales bring in $3,000 to $4,000 a year.

Hardwoods make up two thirds of the forest. The forest had been cut over haphazardly in the past; but, under scientific management, the more useful species are counted upon to prosper and, in time, to dominate the forest. The woodland income also is expected to increase as the forest is improved. Meanwhile, the managed forest protects the lake and assures electricity for Morrisville and other communities.

Ninety Vermont towns and communities have more than 33,000 acres in State-managed municipal forests.

Note:—The author is field information specialist, Soil Conservation Service, Upper Darby, Pa.

A Fish Story—Plus

By Arland W. Andrews

WILDLIFE and recreational benefits have multiplied the value of the irrigation reservoir behind a dam built on the Denley brothers' ranch in southwestern Oregon.

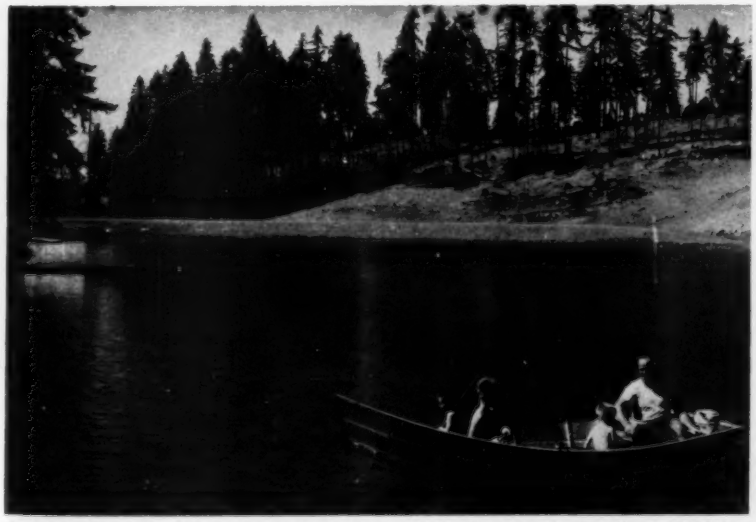
The dam was completed in 1959 with Soil Conservation Service technical help provided through the North Douglas Soil Conservation District with headquarters at Sutherlin. It has a capacity of 132 acre-feet of water and a surface area of 20 acres. In addition to supplying irrigation water, the lake is a welcome recreation center for all the Denley family, including brothers Jack and Joe and their father, Henry. But it is the fishing that draws the most comment.

The lake was stocked with Kamloop and Rainbow trout at the recommended rate of 750 fish to the surface acre. The Denleys say that legs from the deep-throated jumbo bullfrogs that also established residence at the lake make excellent eating.

More than 500 ducks, stopping over on their way north, have rested and fed at the lake in a single season, with as many as 150 of them remaining as late as May. Many deer may be seen watering along the shoreline at dawn and sunset. Bear and cougar tracks reveal that these animals also venture out of the safety of the surrounding hills to share the Denley lake water.

The well planned and constructed water conservation installation not only is a good source of irrigation water for the Denleys' pastures and for their livestock, a haven for fish and wildlife, and a place of family relaxation, but also has helped to prevent flood and soil erosion damage. All of these uses in one package give the Denleys cause enough to take pride in their lake.

Note:—The author is engineer, Soil Conservation Service, Portland, Oreg.



Jack Denley takes time out on a busy day to fish with Ronnie, Randy, and Ricky.

These 12 fish—plus 4 more—resulted from late-afternoon's fishing by the kids in the Denley reservoir.

Multiple Resource Use and Modern Farming

Alternatives will present themselves if we begin by redefining the broad term farming. Rather than limiting it to the production and sales of goods through direct or indirect exploitation of the soil, let us take a broader view and assign a service function to farming: namely, land and resource management. Certainly a good manager . . . in many instances . . . can combine two or more functions as did the farmer who built a large pond for crop irrigation and stocked it and sold fishing rights to the public.

This example brings us to multiple use, which is based on a more inclusive definition of farming and proposes that the income for agriculture can be broadened without curtailing its traditional function. . . .

The American farmer has outgrown the first phase of his evolution and can deliver food and fiber to meet the full demands of the market . . . He is in the midst of his second phase, learning to produce for a specific market. The third and mature phase is the truly challenging one: recognizing his principal function is resource management to the long run benefit of everybody.—HENRY RENOUF, Pres. Massachusetts Association of Soil and Water Conservation Districts.

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OUR NATIONAL PARK POLICY. By John Ise. 701 pp. 1961. Johns Hopkins Press: Baltimore, Md. $10.00.

Few of the more than 72 million persons who visited national parks in the United States last year had the slightest notion of the long, uphill battles waged to build and hold our great system of national parks. The few farsighted and idealistic men and women who foresaw the need for these parks and who battled tirelessly for them are largely unknown to their growing millions of recreation-seeking beneficiaries. But the work of pioneers and contemporary planners and administrations of our national park system is well documented in OUR NATIONAL PARK POLICY, a history and analysis of the national park program and policy. This is not a book for casual reading by the average park visitor. It is, rather, a reference work that traces the development of national parks through one administration after another, and analyzes the problems that confront park administrators today as Americans flock outdoors in phenomenally increasing numbers.

—D. HARPER SIMMS

AMERICAN WILDLIFE AND PLANTS, A GUIDE TO WILDLIFE FOOD HABITS. By Alexander C. Martin, Herbert S. Zim, and Arnold L. Nelson. 500 pp. 1961. Dover Publications, Inc.: New York. $2.00.

This book is a standard reference to the food-habits of wildlife in the United States, particularly of birds and mammals. Except for a paper back and slightly smaller page size, this Dover edition is an exact reproduction of the very successful original edition published in 1951, but out of print for several years.

Part I is introductory and explanatory. It includes two chapters of special interest to soil conservationists: "The Plant Roots of Wildlife" and "Farm Crops and Wildlife." The reading of these chapters will help anyone to understand better the important relationship of agriculture to wildlife.

Part II is concerned primarily with birds and mammals, and presents information regarding the food and feeding for all common species. Part III deals with plants —cultivated as well as wild—that are known to be eaten in significant amounts by wildlife. There are small but accurate distribution maps for most of the common animal and plant species, and many are illustrated with line drawings.

Although our knowledge of the food for wildlife has increased in the past 10 years, this volume is the only general reference on this subject. Anyone interested in wildlife or having responsibilities for its welfare will find this book helpful.

—LAWRENCE V. COMPTON

WILDERNESS, AMERICA'S LIVING HERITAGE. Edited by David Brower. 204 pp. 1961. Sierra Club. San Francisco, Calif. $5.75

This book presents the papers and discussions heard at the Seventh Biennial Wilderness Conference in April 1961. The conference was sponsored by the Sierra Club, a national conservation organization founded in 1892 to protect the Nation's scenic resources of parks, wilderness, wildlife, and the recreation derived from them.

Over the years, the editor points out, "the Sierra Club has been well aware of the dual aspect of conservation, calling on the one hand for much wise utilization of resources on at least 90 percent of our land, and on the other hand for some wise preservation on at most 10 percent of our land." The papers in this volume are concerned mainly with the latter 10 percent. They express the viewpoints of 25 noted commentators, including Secretary of Interior Stewart L. Udall, Associate Justice William O. Douglas, and Governor Edmund C. Brown of California.

The theme of wilderness as a living heritage is illustrated by 26 photographs by Philip Hyde.

—LAWRENCE V. COMPTON